

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:)	Examiner: Atul P. Khare
)	
Winfried Johannes Josef)	Art Unit: 1791
Spickermann)	
Kane Ian Ironside)	Confirmation No. 8176
)	
METHOD AND APPARATUS FOR)	
PRODUCING A MULTILAYER)	
CEMENTITIOUS PRODUCT)	
)	
Serial No.: 10/561,708)	
)	
National-Stage Filing)	
International Application)	
No.: PCT/GB2004/002681)	
)	
International Filing)	
Date: 23 June 2004)	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF KANE IRONSIDE UNDER RULE 312

I, Kane Ironside, do hereby declare as follows:

1. I am a named inventor of the above-captioned patent application and am employed by the proprietor of this application.

2. I hold the following college or university degrees: B. Eng. (Hons) in Materials Science & Engineering; Ph.D. in

Materials Science. Both are from the University of Surrey, United Kingdom.

3. I have extensive experience in formulating and making of gypsum wallboard products, including acoustic plasterboards, processes of making plasterboards, and the engineering and chemistry thereof.

4. I have been informed that certain claims of the above-captioned application, Spickermann et al. application Serial No. 10/561,708 ("present application"), have been rejected as being unpatentable, Deleuil U.S. Patent No. 4,221,599 ("Deleuil") being the primary reference. I am also informed tht Baig Published U.S. Patent Application No. 2002/0139611 ("Baig") as an indication that acoustical insulation is expected and providing optimal acoustical properties is a known result.

5. I have studied the Deleuil patent and have identified important differences between same and the invention that is claimed in the present application. These differences are set out in the following paragraphs.

6. The claimed invention of the present application improves acoustic properties of gypsum wallboard products. Deleuil discloses making articles that are made with waterproofing agents such as calcium stearate and possible other additives that are not according to the claimed invention of the present application. These are pressed (i.e. compacted or

moulded) into dense "ceramic" articles that are not wallboard products as claimed in the application. This is illustrated by Table II in column 10 of Deleuil which reports densities ranging from 1.50 to 1.78. This represents a density that is from at least about 1.5 to about 2 times higher than that of wallboard made with the method of preparing gypsum wallboard in accordance with independent claim 1 of the present application and with the wallboard made according to claims 13, 21 and 22 of the present application.

7. In the manufacture of wallboard, which is the purview of the claims of the present application, at no point is pressure applied to the wallboard during its manufacture, as detailed elsewhere herein. Contrary to this, Deleuil explicitly teaches (consistent with the technical field to which Deleuil is directed) that further pressure is used to make the Deleuil compositions that are moulded; for example, the paragraph at lines 38-45 in column 6 of Deleuil specifies pressures from 30 to in excess of 100 kg/cm².

8. Deleuil specifies (for example at lines 16-18 of column 7) making these moulded articles pours powder into a mould and applies pressure. I observe this is a batch process completely different from the continuous process of making wallboard as claimed in the present application where a slurry is discharged

onto a support to form a sheet by setting the slurry in the absence of compression.

9. The key purpose of the Deleuil invention is to achieve mechanical properties comparable to conventional prefabricated plaster elements (see for example lines 48-53 of column 1), there being no mention of acoustics, which is the focus of the claims of the present application.

10. I now elaborate on the fact that at no point is pressure applied in the manufacture of wallboard, the provenance of the present application's claims. Attached as Exhibit A is the front page of a brochure already of record in the present application. This is a brochure of Grenzebach entitled "Gypsum Technology," or "Baustoffprospek.pdf." As evident from this brochure, the general technique of plasterboard or wallboard manufacturing involves preparing a layer of paper sheet, spreading gypsum composition on the paper and layering a further sheet of paper over the gypsum, thereby forming a sandwich arrangement. This brochure provides a good illustration of the stages of a typical production line, including a step of allowing the slurry to set, as specified in claims 1 and 13 of the present application. See the overview diagram on page 8 and the fact that same does not include a compression stage. There is no positive description of compression in the Grenzebach brochure. Instead, the sandwich arrangement of combined layers

moves through an "extruder" plate or zone in order to consolidate and bind the material into a plasterboard product. The extruder plate does not provide compression; it merely acts to coalesce the layers together, allowing the board shape to be formed and maintained at the correct thickness. I observe that this action is similar to that of a letter passing through the slot of a letterbox.

11. In fact, in the wallboard art of the present invention, compression is undesirable. A final wallboard product comprises at least 50% air in comparison to the density of gypsum. This means that compression should be avoided in manufacture in order to preserve the percentage of air within the gypsum layer. Attached as Exhibit B is a Gyproc Wallboard product data sheet, which indicates that the weight of a 12.5 mm thick plasterboard is 8.0 kg/m² (see the box on the first page), which is equivalent to a density of 0.64 g/cm³. I further observe that the density of gypsum is 2.32 g/cm³ (Reference: CRC Handbook of Chemistry and Physics, 77th Edition, 1996-97, ISBN 0-8493-0477-6, Pg. 422.) This reduction in density of the wallboard (from solid gypsum) is achieved through the introduction of large quantities of air during this normal plasterboard manufacture. Clearly this means the wallboard cannot be compressed; otherwise, this air would be eliminated, causing a dense product to be formed, which is highly

undesirable as it would defeat the purpose of air introduction during manufacturing in order to reduce the weight of the wallboard. I observe that, if a compression step were added such as taught by Deleuil, the result would be an undesirably dense product that would not be wallboard as specified in the claims of the present application, the present claims excluding products moulded with compression such as ceiling tiles made in accordance with Deleuil.

12. I understand Baig is alleged to show optimal acoustical properties would be an expected result. I note that Baig paragraph [0030] mentions sound absorption and it is described as a characteristic measured with an impedance tube and recorded as an NRC value (see paragraphs [0016] to [0017]). NRC is a dimensionless figure and relates to sound absorption. I also note that the measurement technique used is suitable for test items of centimeter dimensions and not the typical wallboard sheet of a size of 3 square meters.

13. The claims of the present application encompass sound insulation to improve wallboard acoustic properties, which is measured in units of dB. Example 2 of the present application describes "sound blocking" properties in the units of Weighted Airborne Sound Reduction index (Rw) in dB. The Rw (dB) value is a measurement of a different acoustic property than that measured with NRC as in Baig for ceiling tiles. The porous

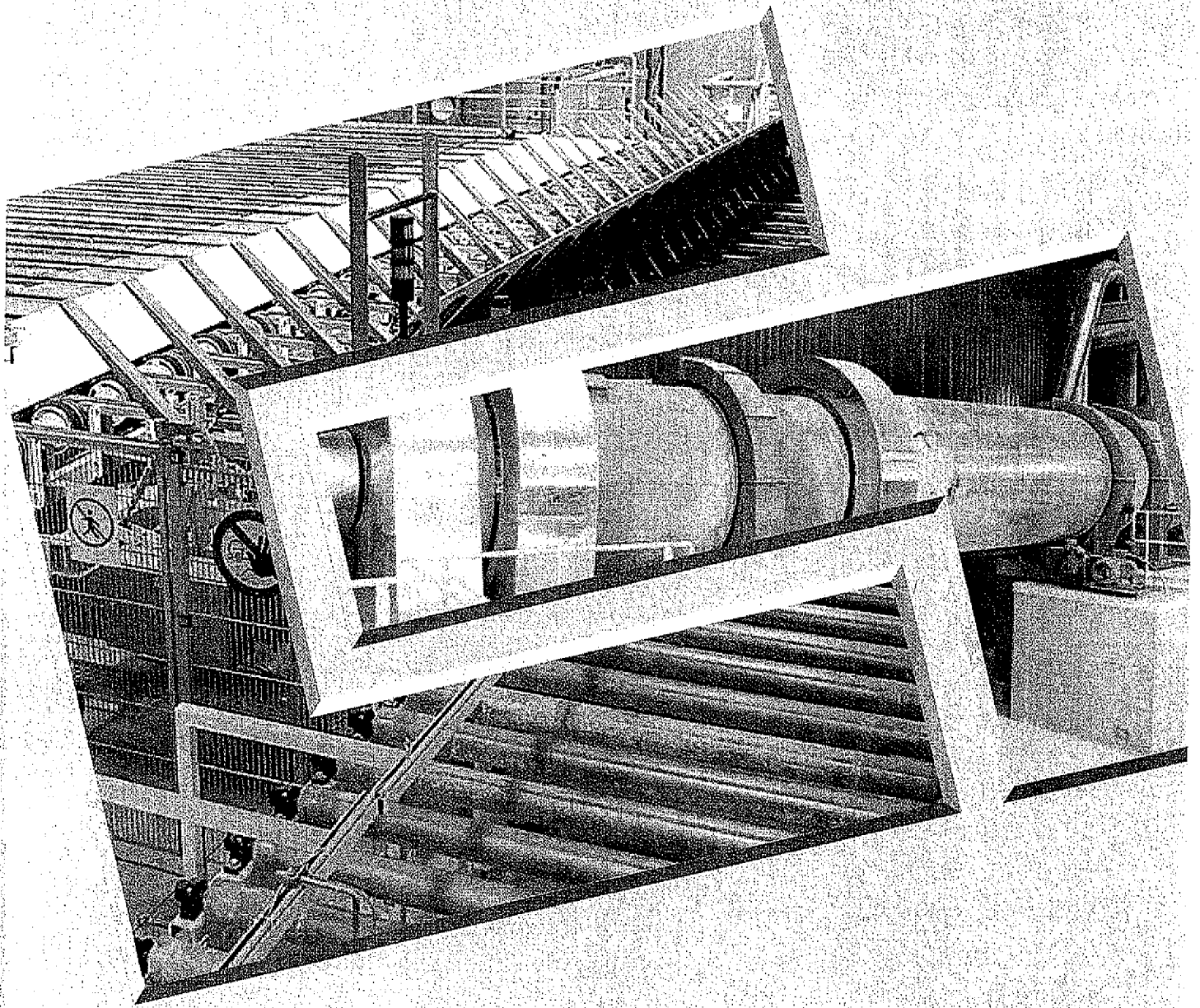
structure of the ceiling tiles of Baig will improve acoustics by absorbing sound due to their fibrous nature. The wallboard as presently claimed in contrast provides "blocking" of sound waves, for example as might be desirable for partition walls of an office suite.

14. I hereby declare that all statements made herein and of my knowledge are true and that all statements made on information and belief are believed to be true; and I further declare that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued therefrom.

Dated: May 26, 2010

K. Ironside
Kane Ironside

EXHIBIT A



Gypsum Technology



EXHIBIT B

Gyproc WallBoard

Product data sheet

Introduction

Characteristics

Standard board product.

Gyproc WallBoard consists of an aerated gypsum core encased in, and firmly bonded to, strong paper liners. Gyproc WallBoard is a plasterboard that is suitable for drylining internal surfaces.

Applications

Suitable for most applications where normal fire, structural and acoustic levels are specified. Suitable for direct decoration or Thistle plaster finish.

Board colour

- ☐ Ivory face paper
- ☐ Brown reverse side paper

Board printing

Face - screw centre markings 'x'.
Edge - product code, EAN number,
board thickness x width x length, edge type.
Reverse - standard and certification.

Board range

Width mm	Length mm	Edge type
9.5mm board Kg/m² = 6.3 R (m²K/W) = 0.05		
900	1800	T/E S/E
	2400	T/E S/E
1200	2400	T/E S/E
12.5mm board Kg/m² = 8.0 R (m²K/W) = 0.07		
900	1800	T/E S/E
	2400	T/E S/E
1200	2400	T/E S/E
	2500	T/E S/E
	2700	T/E S/E
	3000	T/E S/E
	3600	T/E
15mm board Kg/m² = 9.8 R (m²K/W) = 0.08		
900	1800	T/E
	2400	T/E S/E
1200	2400	T/E S/E
	2700	T/E
	3000	T/E

T/E = Tapered Edge S/E = Square Edge

Finishing

Board types

T/E - with Gyproc jointing materials for taped and filled joints or application of Thistle Board Finish or Thistle Multi-Finish plaster.
S/E - for plaster application, Artex texture finish or undecorated applications.

Plastering

The face (Ivory) of Gyproc WallBoard can be plastered with either Thistle Board Finish or Thistle Multi-Finish. There should be the minimum of delay between completion of the lining and the commencement of plastering.

Jointing

Gyproc jointing materials produce durable joint reinforcement and a smooth, continuous, crack-resistant surface ready for priming and final decoration. A number of jointing specifications are available to suit the board type, method of application, and site preference.

Decoration

After the joint treatment has dried, decoration, including any decorator's preparatory work, should follow with the minimum delay.

Repair

Minor damage - Lightly sand the surface to remove burrs and fill flush with Gyproc Easi-Fill or Easi-Fill 45, or two applications of Gyproc Joint Cement. When dry, apply Gyproc Drywall Primer or Gyproc Drywall Sealer to leave the surface ready for decoration.

Deep indents resulting from impact - Check the plasterboard core to ensure that it is not shattered. If intact, apply a coat of Gyproc Joint Filler, or Gyproc Easi-Fill or Easi-Fill 45, followed by the procedure for repairing minor damage as outlined above, once set/dry.

Damaged core and/or broken edges (non-performance situations only) - Remove the damaged area of core. Score the liner approximately 10mm away from the sound plaster around the damaged area, and peel the paper liner away. Apply Thistle GypPrime or PVA to seal the core and surrounding liner. Bulk fill the hole with a stiff mix of Gyproc Easi-Fill or Easi-Fill 45, or Gyproc Joint Filler, and strike off flush. Apply Gyproc Easi-Fill or Easi-Fill 45, or two applications of Gyproc Joint Cement, once the filler is set/dry. When dry, apply Gyproc Drywall Primer or Gyproc Drywall Sealer (only suitable in non-performance situations).

Extensive damage - When the damage is more extensive, it may be necessary to replace that area of plasterboard. It is important that the replacement board is of the same type as specified and installed. Cut out the affected area back to the nearest framing member. Replace the plasterboard, accurately cutting and screw fixing the same type and thickness of plasterboard. Fill edge joints, then tape and finish in the recommended way. Treat the finished surface with Gyproc Drywall Primer or two coats of Gyproc Sealer, if previously specified for vapour control purposes. Redecorate as required.

⚠ It is essential that repairs are made 'like for like'. If the finish is skim plaster, jointing materials must not be used in the repair.

Standards

EN 520: 2004 Gypsum plasterboards, definitions, requirements and test methods

Type A: Gypsum plasterboard

Plasterboard with a face to which suitable gypsum plasters or decoration may be applied.

Board performance

Fire protection

Plasterboard linings provide good fire protection owing to the unique behaviour of the non-combustible gypsum core when subjected to high temperatures. For the purposes of the national Building Regulations, plasterboard is designated a 'material of limited combustibility' (Approved Document B). The surfaces of Gyproc WallBoard are designated Class 0 (for the purposes of national Building Regulations). Please refer to the table below.

Fire resistance

Please refer to the appropriate WHITE BOOK product or systems section for information on the fire resistance of building elements lined with Gyproc WallBoard.

Reaction to fire test performance

Standard	Performance
BS 476: Part 6: 1989 Method of test for fire propagation for products	Index of performance (I) not exceeding 12 and a sub-index (i1) not exceeding 6.
BS 476: Part 7: 1997 Surface spread of flame tests for materials	Class 1 (both sides)
EN 520: 2004	Classified without further testing as A2-s1, d0

Thermal conductivity

① Gyproc WallBoard - 0.19W/mK

Effect of temperature

Gyproc WallBoard is unsuitable for use in areas subject to continuously damp or humid conditions and must not be used to isolate dampness. Plasterboards are not suitable for use in temperatures above 49°C, but can be subjected to freezing conditions without risk of damage.

Effect of condensation

The thermal insulation and ventilation requirements of national Building Regulations aim to reduce the risk of condensation and mould growth in new buildings. However, designers should take care to eliminate all possibility of problems caused by condensation, particularly in refurbishment projects.

Installation

General

It is important to observe appropriate health and safety legislation when working on site i.e. personal protective clothing and equipment, etc. The following notes are intended as general guidance only. In practice, consideration must be given to design criteria requiring specific project solutions.

Handling

Manual off-loading of this product should be carried out with care to avoid unnecessary strain. For further information please refer to the Manual Handling section of the SITE BOOK or Manual Handling Guide, available to download from www.british-gypsum.com

Cutting

This product may be cut using a plasterboard saw or by scoring with a sharp knife and snapping the board over a straight edge. Holes for switch or socket boxes should be cut out before the boards are fixed using a utility saw or sharp knife.

When cutting boards, power and hand tools should be used with care and in accordance with the manufacturers' recommendations. Power tools should only be used by people who have been instructed and trained to use them safely. Appropriate personal protective equipment should be used.

Fixing

Fix boards with decorative side out to receive joint treatment or a skim plaster finish. Lightly butt boards together. Never force boards into position. Install fixings not closer than 13mm from cut edges and 10mm from bound edges. Position cut edges to internal angles whenever possible, removing paper burrs with fine sandpaper. Stagger horizontal and vertical board joints between layers by a minimum of 600mm. Locate boards to the centre line of framing where this supports board edges or ends.

Gyproc WallBoard

Product data sheet

Health & Safety

1. Identification of the substances / preparation and company

Gyproc plasterboards

Gyproc WallBoard	Gyproc FireLine MR
Gyproc WallBoard 4TE	Gyproc HandiBoard
Gyproc WallBoard TEN	Gyproc Moisture Resistant
Gyproc WallBoard DUPLEX	Gyproc Plank
Gyproc CoreBoard	Gyproc SoundBloc
Gyproc DuraLine	Gyproc SoundBloc MR
Gyproc DuraLine MR	Gyproc SoundBloc RAPID
Gyproc FireLine	Gyproc SoundBloc RAPID MR
Gyproc FireLine DUPLEX	Gyproc Ergo900

Supplier British Gypsum
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Loughborough
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LE12 6HX

Telephone 08705 456123

Recommended uses: Gyproc plasterboards are used as internal linings in buildings.

This information reflects typical values and is not a product specification.

2. Composition / information on ingredients

General composition: Calcium sulphate dihydrate encased in paper liners, natural constituents may include minor amounts of quartz. Small quantities of chopped glass fibre, microsilica and vermiculite may be added, with starch, foam and dispersants.

Any board may contain small quantities of chopped man-made mineral fibre and microsilica.

3. Hazards identification

THE MOST IMPORTANT HAZARDS ARE:

These products are not classified as dangerous according to CHIP.

Dust from sawing or sanding may irritate the respiratory system, skin and eyes.

4. First aid measures

Eye contact	Wash eyes with clean water.
Skin contact	Wash thoroughly with soap and water.
Ingestion	DO NOT INDUCE VOMITING. Rinse out mouth thoroughly and give plenty of water.

Inhalation If irritation occurs, remove person to fresh air.

General Get medical attention if any symptoms persist.

5. Fire fighting measures

The products do not pose a fire hazard. However, some packaging materials or facings may burn.

Suitable extinguishing media – water, foam, carbon dioxide or dry powder.

6. Accidental release measures

Not applicable.

7. Handling and storage


Use – Minimise dust generation when sawing or sanding in poorly ventilated places. Avoid eye contact - see Section 8 for recommended personal protective equipment and Section 3 for hazards identification.

Plasterboards will not support body weight between rafters, joints or frame members.

Manual handling – Sheets of plasterboard can be unwieldy, use an appropriate lifting technique. The weight of each sheet can vary between products. For manual handling purposes assume the following:

Gyproc WallBoard weights

Board	Board thickness mm	Board width mm	Board length mm	Board weight kg	Pallet weight tonnes
Gyproc WallBoard	9.5	900	1800	10.2	1.1
	9.5	900	2400	13.6	1.4
	9.5	1200	2400	18.1	1.7
	12.5	900	1800	13.0	1.1
	12.5	900	2400	17.3	1.4
	12.5	1200	2400	23.0	1.2
	12.5	1200	2500	24.0	1.9
	12.5	1200	2700	25.9	1.6
	12.5	1200	3000	28.8	1.5
	12.5	1200	3600	34.6	1.4
	15	900	1800	15.9	1.0
	15	900	2400	21.2	1.3
	15	1200	2400	28.2	1.5
	15	1200	2700	31.8	1.3
	15	1200	3000	35.3	1.4

 All weights are approximate.

Mechanical handling – The dimensions of the pallet vary depending on the product size. To avoid potentially overloading a lift truck, it is important that any effect on load centres is considered. The nominal weight of each palletised load is given within the weights table in this section of this document.

Health & Safety (continued)

Storage – Store on pallets supplied in dry conditions. To maintain stability, place pallets on firm level ground, and ensure that stacks are both level and vertical.

(NB) When working with individual boards, only work from a single pallet, not a stack.

Pallet stacking heights

The maximum stack heights on level concrete floors and vertical stacks are as follows:-

Board width mm	Board length mm	Pallet stack height picks
900	1800, 2400	4
1200	1800	5
1200	2400, 2500, 2700	6
1200	3000	7
1200	3600	10

8. Exposure control / personal protection**Workplace Exposure Limit**

Substance	Total Inhalable	Respirable
Plaster	10mg/m ³ 8hr TWA	4mg/m ³ 8hr TWA
Quartz (silica)	–	0.1mg/m ³ 8hr TWA
Man Made Mineral Fibres (MMMF)	5mg/m ³ 8hr TWA (gravimetric method)	–

Personal protection

Respiratory Use in a well ventilated area. Where practicable use engineering methods to control dust levels. If the exposure standards could be exceeded use a disposable face mask complying with *EN 149 FFP*.

Skin Wear appropriate clothing to protect against repeated or prolonged skin contact.

Eye If there is a risk of material entering the eye, wear eye protection to *BS EN 166*.

9. Physical and chemical properties

Appearance Flat sheet boards in different widths and thicknesses, with a square or tapered edge.

10. Stability and reactivity

No special physical conditions need to be avoided. No specific restrictions regarding incompatible materials.

11. Toxicology information

No known toxicological effects.

12. Ecological information

Stable product with no known adverse environmental effects.

13. Disposal consideration

Waste from gypsum plasterboard products is normally classified as 'non-hazardous, non-inert' and is fully recyclable. Please refer to the British Gypsum Plasterboard Recycling Service literature or contact the Plasterboard Recycling Customer Service Centre on 0800 6335040 for details. Other methods of disposal are available. Always seek the advice of a trained and competent professional.

14. Transport information

Not classified as hazardous for transportation.

15. Regulatory information

Not classified under the CHIP regulations.

16. Other information

Control of Substances Hazardous to Health Regulations
The Manual Handling Operations Regulations
HSE Guidance Note EH40: Workplace Exposure Limits
Gypsum Wastes – Environment Agency Information Sheet
The British Gypsum WHITE BOOK
The British Gypsum SITE BOOK
The British Gypsum website: www.british-gypsum.com

Note to user: This Product Data Sheet does not constitute a workplace risk assessment for COSHH.

There are a number of situations where the approach to manual handling of British Gypsum products should be considered. For further guidance, please refer to the Manual Handling Section of the SITE BOOK or the Manual Handling Guide, available to download from www.british-gypsum.com

Date of previous version: June 2008.

Gyproc, Thistle, Gypframe, Glasroc and Artec are all registered trade names of BPB United Kingdom Limited. Isover is a registered trade name of Saint Gobain.

Proprietor: BPB United Kingdom Limited registered in England 734396, registered office Aldwych House, 81 Aldwych, London, WC2B 4JQ.

British Gypsum reserves the right to revise product specifications without notice. The information in this document was correct to the best of our knowledge at the time of publication. It is the user's responsibility to ensure that it remains current prior to use. The information in this document is for guidance only and should not be read in isolation. Users should read and familiarise themselves with all the information contained in this document and ensure that they are fully conversant with the products and systems being used, before subsequent specification or installation.

For a comprehensive and up to date library of information visit the British Gypsum website at: www.british-gypsum.com

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